

SUBMITTED TO
THE OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE

**DOMESTIC PRODUCERS' COMMITMENTS REGARDING ACTIONS TO FACILITATE
POSITIVE ADJUSTMENT TO IMPORT COMPETITION**

Domestic Producers:

The Committee on Pipe and Tube Imports;
the Minimill 201 Coalition (Flat Products);
Allied Tube & Conduit Corporation; Alloy
Stainless Products Co., Inc.; American Cast
Iron Pipe Company, American Steel Pipe Division;
Anvil International, Inc.; Bitrek Corporation;
Capitol Manufacturing Company; Century Tube
Corporation; Gallatin Steel Company; Geneva
Steel Company; Hannibal Industries, Inc.;
Ideal Forging Corporation; IPSCO Steel Inc.;
IPSCO Tubulars Inc.; Leavitt Tube; LTV Copperweld;
Lone Star Steel Company; Maass Flange Corporation;
Maverick Tube Corporation; Newport Steel
Corporation, a division of the NS Group;
Northwest Pipe Company; Nucor Corporation;
Rouge Steel Company; Searing Industries;
Sharon Tube Company; Steel Dynamics, Inc.;
Stupp Corporation; Tex-Tube Company; Vest Inc.;
WCI Steel, Inc.; Weirton Steel Corporation;
and Wheatland Tube Company

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COMMITMENTS REGARDING ACTIONS TO FACILITATE POSITIVE ADJUSTMENT TO IMPORT COMPETITION

To ensure that they are fully competitive with imports when section 201 relief terminates, the following producers of various steel products possess plans to facilitate positive adjustment to import competition. *See* 19 U.S.C. § 2252(a)(6)(B). Although the planned specific actions vary by producer, collectively these industries intend further modernization of equipment for more efficient production, as well as development of new specialized products that will enhance the competitiveness. The specific plans of the individual producers are provided as exhibits to this submission, but we summarize below the salient features of these individual plans, which together constitute a comprehensive response to facilitate adjustment and enhance competitiveness for each of these domestic industries.

I. PRODUCERS OF FLAT-ROLLED STEEL PRODUCTS

Together, these domestic producers of flat-rolled steel intend to invest between approximately \$2.3 and \$2.6 billion over a four year period of relief. The individual plans of these flat-rolled producers are attached as Exhibit 1.

In an effort to meet import competition, these domestic producers of flat-rolled steel plan a series of investments that will improve product quality, expand product range, and increase operating efficiency. These domestic producers plan to invest approximately \$122 million in projects that will improve product characteristics and increase customer satisfaction. These domestic producers plan to invest heavily in new equipment that will meet the stringent requirements of large scale industrial purchasers.

To meet the demands of the marketplace, these domestic producers also intend to adjust their production facilities in order to be able to produce those items for which demand is particularly strong.

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Accordingly, these domestic producers intend to invest between \$121 and \$131 million in the equipment and know-how needed to expand their product range.

To optimize resource use, these producers plan to invest between \$510 and \$536 million in projects that will promote manufacturing efficiency by, among others, increasing throughput and reducing downtime. These projects generally involve purchasing state-of-the-art machinery and training personnel. These domestic producers realize that in order to increase their competitive position with respect to imports, they must retire obsolete equipment and adopt and test new manufacturing models. They must also purchase the equipment necessary to remove production bottlenecks and optimize the capabilities of existing equipment.

Additionally, these domestic producers plan to invest between \$393 and \$413 million in new equipment that will reduce unit costs through economies of scale. In some instances, investments of this type will permit the domestic industry to successfully enter markets for high margin products.

These domestic producers seek to balance with more immediate concerns the forward-looking investment projects described above. That is why they plan to invest over \$170 million to maintain current operations and existing equipment. These domestic producers are committed to preserving their manufacturing strength.

Without solid distribution networks, however, manufacturing strength would become a liability. These domestic producers therefore plan to enhance market share through various investment projects, valued at approximately \$64 million, that will allow them to effectively exploit their manufacturing strength. These domestic producers recognize that a well thought out distribution strategy will require

them to develop the networks and facilities necessary to bring their product to the market in a cost effective fashion.

Crucially, these domestic producers realize that long-term survival in the face of intense import competition will require them to significantly pare down their costs. That is why their adjustment plans commit between \$940 million and \$1.12 billion to cost reduction investment projects. Some of these domestic producers will take advantage of import relief to restructure themselves financially. Others will invest in new machinery that reduces raw material, energy, and environmental costs. Yet others will take advantage of innovative government programs that promote clean manufacturing technologies.

In addition to the significant adjustment actions taken individually by these companies, the four electric arc furnace producers, Gallatin, IPSCO, Nucor, and SDI will participate through a trade association of EAF producers, the Steel Manufacturers Association (“SMA”) in collective research on improving EAF steelmaking efficiency and quality. *See* Exhibit 2.

In sum, these domestic flat-rolled producers have substantial and specific plans to facilitate positive adjustment to imports. They will enhance competitiveness with new and upgraded equipment which will permit them to improve efficiency and product characteristics and quality.

II. PRODUCERS OF CARBON AND ALLOY WELDED TUBULAR PRODUCTS

The following producers of carbon and alloy tubular products collectively intend significant investment of approximately \$159 million over a four year period of relief. This money will be invested in a variety of projects, including further modernization of equipment and application of technological

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innovations to increase efficiency and productivity. The specific plans of the individual producers are provided as Exhibit 3.

These domestic producers seek to improve product quality, expand product range, enhance production efficiency, strengthen their distribution networks and increase market share, and significantly reduce costs. To this effect, these domestic producers intend to invest \$10 million to improve the quality of their products. These domestic producers recognize that enhancing competitiveness against imports will require that their product become distinctive for its higher durability and reliability. These domestic producers therefore intend to invest in the latest machinery and quality control methods to ensure world-class customer satisfaction.

The market for welded tubular products other than OCTG is fickle. Accordingly, these domestic producers recognize that expanding product range is crucial to meeting customer demands and effectively competing with imports. The adjustment plans of these domestic producers therefore commit almost \$56 million to investment projects that would enhance product range. New machinery will allow these domestic producers to focus on the value-added, high-end of the market, where competition with imported commodity pipe is less intense. It will also increase their flexibility with respect to customer specifications as to coatings, colors, marking and cutting to size and finishing.

Additionally, these domestic producers intend to undertake investment projects that will permit significant improvements in efficiency of operations. These domestic producers seek to upgrade their existing equipment using the latest technology, in order to eliminate production bottlenecks, reduce downtime, and increase throughput. To that effect, these domestic producers intend to invest almost \$27 million.

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These domestic producers also intend to pursue investment strategies, valued at approximately \$48.7 million, that will allow them to achieve economies of scale. These domestic producers intend to purchase equipment that will allow them to significantly reduce the burden of fixed costs on a per unit basis. By increasing market share, these domestic producers intend to reduce overall operating expenses.

Solid distribution and marketing networks are a crucial competitive advantage in the industry for welded tubular products other than OCTG. High transportation costs, for example, can significantly impede access to market and impair the ability to provide quality service. Accordingly, these domestic producers intend to invest approximately \$3.7 million to boost their distribution and marketing capabilities. Among others, these domestic producers intend to implement computerized methodologies that will allow them to handle an ever-growing account base at reduced unit transaction costs.

These domestic producers recognize that any strategy to enhance competitiveness against imports would be incomplete without cost reduction measures. These domestic producers therefore intend to invest heavily on machinery and manufacturing models that will allow them to sustain profits in the face of lower prices. To address all manners of cost, including raw material, freight, energy, personnel, and production costs, investments of approximately \$16.7 million are planned.

These companies, representing a large portion of the domestic industry of welded carbon tubular products, have ambitious plans to facilitate adjustment to increased import competition when relief terminates.

III. PRODUCERS OF CARBON AND ALLOY STEEL FITTINGS,

FLANGES, AND TOOL JOINTS

The following producers of carbon and alloy steel fittings, flanges, and tool joints possess adjustment plans which reflect the intention to invest a combined \$12.8 million to \$14.8 million to increase competitiveness over a four year period of relief. Although the planned specific actions vary by producer, collectively these producers commit to further modernization of equipment for more efficient production, including implementing technological advances and automation. *See Exhibit 4.*

These domestic producers intend to undertake a series of projects that will increase productivity, reduce costs, and improve quality. For example, these domestic producers plan to invest at least \$7 million to reconfigure their production processes by developing and installing proprietary technology, restructuring and consolidating their manufacturing operations, and financing ongoing R&D projects that seek to enhance factory productivity.

To reduce older capacity and eliminate production bottlenecks, these domestic producers intend to purchase new equipment that exploits state-of-the-art technology. These planned investments, valued at between \$4.75 and \$6.75 million, will achieve much higher productivity rates while substantially lowering labor costs.

These domestic producers also intend to upgrade and modernize their existing facilities and equipment. To this effect, these domestic producers are willing to commit approximately \$1.1 million dollars. These funds will be used to preserve manufacturing strength, optimize the use of current equipment, and improve plant layout.

In sum, these domestic producers of carbon and alloy steel fittings, flanges, and tool joints have substantial and specific plans to enhance their competitiveness with new and upgraded equipment which

will permit them to improve efficiency and product characteristics and quality. These commitments will facilitate positive adjustment to import competition.

I. PRODUCERS OF STAINLESS STEEL FITTINGS AND FLANGES

The following producers of stainless steel fittings and flanges possess adjustment plans which reflect the intention to invest approximately \$7.8 million over a four year period of relief for further modernization of equipment for more cost efficient production, including implementing technological advances and automation. The specific plans of the individual producers are provided as Exhibit 5 and are summarized below.

In order to improve their competitive position with respect to imports, these domestic producers intend to improve their manufacturing operations and purchase new equipment. The efficiencies and cost reduction thereby achieved will permit them to lower prices without sacrificing profitability.

These domestic producers intend to invest over \$2 million to enhance their production systems, improve automation, and implement innovative manufacturing methodologies. They also intend to invest approximately \$5.8 million in specialized manufacturing equipment that will achieve higher productivity rates than under existing equipment and further mechanize the production process. The new equipment will allow the domestic producers to fully exploit the improvements in manufacturing methodologies. These domestic producers then plan to close down inefficient operations and retire old capacity, but without surrendering market share.

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These domestic producers have substantial and specific plans to enhance their competitiveness with new and upgraded equipment which will permit them to improve efficiency and product characteristics and quality. These adjustments will facilitate positive adjustment to import competition.

CONCLUSION

Each of the listed domestic producers of flat-rolled products, carbon and alloy welded tubular products, carbon and alloy fittings, flanges, and tool joints, and stainless steel fittings and flanges intends to facilitate positive adjustment to import adjustment in light of the Commission's finding of serious injury and the imposition of an appropriate remedy.

Respectfully submitted,

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Tube Imports; the Minimill 201 Coalition (Flat);
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Products Co., Inc.; American Steel Pipe Division of
American Cast Iron Pipe Company; Anvil International,
Inc.; Bitrek Corporation;
Capitol Manufacturing Company; Century
Tube Corporation; Gallatin Steel Company;
Geneva Steel Company; Hannibal Industries, Inc.;
Ideal Forging Corporation; IPSCO Steel Inc.;
IPSCO Tubulars, Inc.; Leavitt Tube; LTV
Copperweld; Lone Star Steel Company; Maass
Flange Corporation; Maverick Tube Corporation;
Newport Steel Corporation, a division of the
NS Group; Northwest Pipe Company; Nucor Corp.;
Rouge Steel Company; Searing Industries;
Sharon Tube Company; Steel Dynamics, Inc.;
Stupp Corporation; Tex-Tube Company;
Vest, Incorporated; WCI Steel, Inc.;
Weirton Steel Corporation; and
Wheatland Tube Company

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EXHIBIT 1

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EXHIBIT 2

STEEL MANUFACTURERS OF AMERICA’S PROPOSALS FOR RESEARCH AND FOR IMPROVING STEELMAKING EFFICIENCY AND QUALITY

The 201 minimill industry coalition, composed entirely of EAF minimills, has coordinated through the trade association that the coalition members are a part of, the Steel Manufacturers Association (“SMA”), the following joint research commitments to improve efficiency and reduce costs for EAF producers as part of an industry-wide adjustment plan to import competition.

A. IRON UNIT SUPPLY

a) Liquid Iron

EAF mills have historically depended upon recycled scrap. About 10 percent of this is home scrap, but the 90 percent purchased material represents about 40 percent of overall production costs per ton of shipments. Therefore purchased scrap costs must be the focus of any effort to reduce overall production costs. In recent years, alternative iron (AI) units such as Brazilian and Russian pig iron and Venezuelan sponge iron (DRI, HBI) have become available, and when domestic scrap prices surge, these become part of the metallics charge. They also dilute the metallic residuals (Cu, Ni, Mo, Cr, Sn) in the scrap and, despite their high cost, have enabled some EAF producers to meet the more stringent residual specifications for selected long and flat-rolled products. At the same time, the recovery of iron units from scale, sludge, and EAF dust is becoming environmentally and economically attractive due to rising disposal costs. These diverse trends have led to the conclusion that a coal based reduction process to produce iron units should ultimately be developed on-shore. Natural gas is too expensive for iron oxide reduction in the United States, as shown by the high number of facilities that have been shutdown while the iron carbide process pioneered by Nucor in 1996 was technologically unsuccessful.

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But coal contains ash and sulfur which both remain intimately associated with the reduced iron at intolerable levels. Therefore a liquid iron must be produced to achieve separation.

There have been several efforts to develop a liquid iron process. Iron Dynamics, a subsidiary of Steel Dynamics, duplexes a rotary hearth solid reduction Process (RHF) with a submerged arc furnace (SAF). Midrex has a similar approach with FASTMET and FASTMELT, and recently commissioned a commercial unit in Japan. Mannesmann is touting REDSMELT, also a combination of an RHF and an SFA. BHP has recently joined with Nucor to install a HIS melt unit, in which coal, O₂ enriched air, and iron oxide fines are reacted at steelmaking temperatures. North Star plans to trial the TECNORED smelting process in Texas. All of these processes require considerable capital, and are either in the pilot stage or have proven to be more difficult to commission than expected. Yet they offer the opportunity to :

- add to the prime iron unit stream
- utilize cheap U.S. coal
- utilize waste iron oxide units to enhance plant yields
- increase EAF productivity significantly at 25 to 30 percent of the metallic charge
- allow cost flexibility of metallics for the producer

b) Scrap Upgrading

The potential tonnage of scrap in the U.S. has been estimated at several hundred million tons. The recovery of durable goods (cars, “white” goods, cans) is approaching a maximum level. Prompt scrap already enters the scrap stream quickly. But large tonnages are tied up in structures, or dispersed geographically so that recovery may be uneconomic. One source that could be tapped to a greater

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degree is municipal waste. Historically, it has been unattractive because of high metallic residual levels coupled with food contamination which lead to unsanitary handling conditions. However, where municipal incinerators are used, the food issue disappears and the residual issue may be solved by a scrap beneficiation process. The upgrading of this type of scrap is necessary, but all purchased grades call for tighter chemical as well as physical scrap specifications.

The use of shredded auto scrap, sized pig iron, and sponge iron shapes has revealed productivity advantages when melting sized scrap and also has promoted more creative charging procedures. Since most minimills use large tonnages of liquid oxygen derived from air (20 percent oxygen) and therefore vent the 80 percent nitrogen, the economics of cryogenic sizing of scrap should be revisited. This same technology could apply to discarded tires which could become a source of both carbon and steel units and solve a growing environmental problem.

c) Engineering for End of Life

Some European car manufacturers are required to dismantle their scrap cars. This should impact material selection and design. Certain components (powdered metal gears high in Cu, copper motors and wiring, mercury switches, lead wheel-weights) create disproportionate environmental problems for steelmakers. An industry-wide dialogue with auto manufacturing companies in the U.S. could be fruitful.

ACTIONS REGARDING IRON UNIT SUPPLY

- A1. Establish an SMA- POD group to monitor and report semi-annually on worldwide activities for non blast furnace liquid iron production. The collaborators in the U.S. would be the mills and suppliers in this field.

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- A2. SMA to establish with ISRI a group to identify and assess the opportunities for iron unit supplies from co-generating Municipal Waste Units.
- A3. SMA to establish with ISRI a joint committee to develop chemical specifications for purchased scrap suitable for commodity trading and metallurgical purposes.
- A4. SMA-POD to work with gas companies (Air liquide, Praxair, *etc.*) and DOE (OIT) on projects to re-examine the technical and economic feasibility of cryogenic treatment of scrap and tires.
- A5. SMA with ISRI & VRP & others to initiate a dialogue with U.S. auto manufacturers and dismantlers on components that create environmental problems for steel recyclers.

STEEL MANUFACTURING PROCESSES

a) Melting

The EAF has become a very productive process over the last decade with the installation of powerful transformers, an increasing ratio of chemical to electrical energy input to the furnace, and the capture of waste heat by the cold scrap charge, all of which reduce power-on time. This has reduced heat losses per ton from the furnace and lowered overall energy consumption to around 5 Million Btu per ton, or about one third that of the BOF steelmaking route.

It appears that power input in several shops has reached the point where further productivity will not be realized by running at higher voltages and higher currents. The largest electrodes (32") already command a premium price, and to increase diameters beyond this would be uneconomic and even impracticable. To achieve higher productivity therefore puts the onus back onto greater chemical energy input, more efficient use of existing electrical energy, and further preheating of scrap to reduce the energy requirement per ton.

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The ultimate in scrap preheating is to charge a carbon saturated liquid iron which provides both chemical and sensible heat to the EAF. At 30 percent of the charge, which is close to the maximum because of melt-in carbon levels, productivity can be increased by 20 to 25 percent. This issue has already been discussed.

The chemical energy issue involves better utilization of injected oxygen to burn carbon monoxide (CO), leaving the bath to carbon dioxide (CO₂). This is called post-combustion. Burning the CO above the bath is relatively simple; capturing this heat of oxidation back in the steel bath is not so easy. An essential requirement is waste gas analysis in real time so that the effectiveness of the oxygen injection process is optimized. A system (EFSOP) has recently been tested on two installations with some mixed degree of success, but significant development is still required.

There is also a need to optimize the overall process by utilizing a furnace model that monitors the key input/output variables and adjusts them instantaneously. For example, control of FeO levels in the slag through carbon injection would increase yield and enhance desulfurization. A proposal to apply such a model recently received DOE funding and SMA support and work is scheduled on an EAF shortly.

The electrical efficiency is very much a function of foamy slag quality once the scrap has melted. This mass of slaggy bubbles floating on the steel bath shields the furnace walls and roof from the arc, and optimizes heat transfer by radiation. Bath stirring is also critical for heat transfer, and one lance in particular—the COJET—seems to be very effective in this respect.

The availability of electrical power is a critical issue for some mills to avoid peak loading costs. A study by NIPSCO sponsored by the DOE and SMA is nearing completion. The goal is to minimize the

load variation for a utility supplying power to a given industrial area. In return, the utility may be able to offer power to heavy users at a reduced cost.

Information on all the above needs to be disseminated to the U.S. minimill industry, so that all mills have the opportunity to discuss potential benefits with their utilities.

2. Casting

The continuous casting of steel today is under good control, with long sequences where product mix permits high casting speeds, high cast product yields, low energy consumption, and internally “clean” steel. There are still problems with nozzle clogging, even on Si killed steel, and random surface quality issues. There is always room for more caster instrumentation, but there has to be a need to justify the cost and maintenance required. However, the role of sensors in all phases of manufacturing will grow in importance not so much to reduce manpower levels which are already extremely low, but to enable processes to be optimized for productivity, yield, and energy consumption.

One of the technologies in the spotlight at this time is strip casting which offers the industry a capital cost per ton which is even lower than for thin slab casting. However, the process is still not proven commercially (Castrip at Nucor will be the pioneer next year) and to date has not produced deep drawing AK automotive steel. There are also concerns about the excessive casting speed required to produce even 500,000 tpa. On the positive side, however, there is an opportunity to cast a very fine-grained steel which might tolerate high residuals without detriment to surface quality at one mill. This would not only reduce melting costs but offer the possibility of producing new products such as those rolled in the two-phase region.

c) Processing

In the long products area, the endless rolling process is being practiced outside the U.S.—bars are welded together prior to the roughing mill in a welding stand. The benefits are an increase in both productivity and yield by several percent for the larger billets of about two tons.

The stainless coating of rebar is a new development, using a spray technique on the billet and extruding through rolling. As the U.S. infrastructure is rebuilt and construction of new power plants continues, this enhanced rebar product will extend structural life.

The building industry is an expanding market for steel, and while non loadbearing studs can be made from lower grades of steel, loadbearing studs, decks, and roofing call for steel with specific properties and chemical specifications.

ACTIONS

- B1. The SMA Ad Hoc Energy Group to conduct a yearly seminar on “best energy practices” within the minimill sector
- B2. This group will also monitor the EFSOP and SMA MODEL STUDY furnaces to compare results on productivity and energy consumption with data from 1.
- B3. They will also request a review by NIPSCO of their peak power control study and possible relevance to other regions.
- B4. SMA-POD to monitor the DOE nozzle clogging study at the University of Missouri, Rolla where a non-clogging nozzle refractory is being sought. Disseminate information to the membership.
- B5. SMA-POD to monitor thin strip casting and arrange for product evaluation by the DOE national laboratories. Disseminate information to membership.
- B6. SMA-POD to evaluate the benefits/costs of installing endless rolling in a bar mill.

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- B7. SMA to initiate contacts with university civil engineering groups to promote new steels that are or might be produced by the minimills. Work with organizations like the Deck Institute, and Concrete Rebar Institute to promote steel building materials
- B8. The SMA and DOE will collaborate to determine how to capture and utilize low level heat from manufacturing operations.
- B9. SMA to work with the DOE national laboratories and NDT vendors on identifying the sensors which are most urgently needed by the minimill sector of the steel industry.

C. ENVIRONMENTAL ISSUES

The U.S. minimills are environmental models relative to the integrated plants, often located in rural communities with no visible stack emissions. They also use scrap which would otherwise be discarded in a dump—over 40 million tons annually and are the largest steel recyclers in the world. Yet the EPA remains confrontational rather than co-operative and does little to accelerate the permitting processes or to help in the resolution of technical issues. The ever-increasing paperwork load has become a major problem for mills lean in personnel and there seems to be no relief in sight. Key technical issues include:

- Delisting of KO61 if the EAF dust from a mill meets the necessary criteria. This is increasingly likely as the percentage of AI units in the charge increases.

- Technical help with tracing the origin and elimination of dioxins and mercury. These trace chemicals are unfamiliar to steel makers.

- The elimination of silicate slag “dusting.”

ACTIONS

- C1. Establish links between the SMA Environmental Committee and the DOE so that they can work collaboratively with the EPA on the above issues.
- C2. Disseminate information to SMA members on the success of incorporating EAF dust in RHF pellet/briquette charges.

D. SERVICES

Service departments such as maintenance, safety, transportation, and human resources are critical to the success of operations. The SMA provides a forum to share successes in these areas to the benefit of all members. To this end, the following actions will be taken:

ACTIONS

- D1. The SMA-POD Group will prepare a report to be updated quarterly on best maintenance practices in manufacturing operations.
- D2. The SMA-POD Group will explore the possibility of contracting regional companies for NDT work to reduce maintenance costs.
- D3. The SMA- HR Committee will prepare a report on best safety practices, and publish success stories for distribution to the membership.
- D4. The SMA-HR Committee will discuss personnel training programs and identify those which seem to be most effective. A grant application has just been made to the Department of Labor on ergonomic safety training for minimills.
- D5. The SMA-DOE steel fellowship program for college students will continue.
- D6. The SMA will set up a group to explore the concept of regional carriers to eliminate deadhead backhauling and reduce transportation costs.

CONCLUSION

The 22 actions proposed by the 201 Minimill Coalition Technical Group are summarized in Table I with some estimate of the probability of implementing them along with a projection of annual potential savings. The cost savings associated with these programs can only be approximated but the total could well exceed \$500 million annually or about \$10 per shipped minimill ton. Implementation will proceed as

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quickly as possible if a successful ITC remedy is initiated because cost reduction is vital for the survival for the minimill sector but also because continuous improvement is their normal mode of operation.

Table I: Actions and Implementation Probability, and Annual Potential Savings from Implementation

Number	Action	Prob.of Implem	Cost of Study	Annual Potential Savings
A1	Monitoring non-blast furnace liquid iron production	60 %	\$3,000	\$250,000,000
A2	Use of more municipal waste scrap	60%	\$5,000	\$10,000,000
A3	Improved chemical specifications. for purchased scrap	70 %	\$20,000	\$100,000,000
A4	Cryogenic beneficiation of scrap and tires	40 %	\$5,000	\$40,000,000
A5	Auto dismantling-dialogue with auto companies	50 %	\$10,000	--
B1	Minimill Best Energy Practices Seminar	80 %	\$10,000	\$75,000,000
B2	EFSOP, SMA-EAF MODEL Studies	90 %	\$3,000	\$50,000,000
B3	Review of NIPSCO peak lading study	100 %	\$10,000	\$50,000,000
B4	Nozzle clogging update from Univ. of Missouri	80 %	\$2,000	\$20,000,000
B5	Evaluation of thin strip product by National Labs.	80 %	\$10,000	\$100,000,000
B6	Evaluation of endless rolling technology	80 %	\$3,000	\$15,000,000
B7	Contact with civil engineers to promote new steels	60 %	\$10,000	--
B8	Capture of low-level heat from manufacturing ops.	70 %	\$10,000	\$10,000,000
B9	Identification of critical sensors for minimills	70 %	\$10,000	\$15,000,000
C1	Help on environmental issues from DOE, EPA	70 %	\$30,000	\$100,000,000
C2	Monitoring of use of EAF dust in RHF charges	70 %	\$3,000	\$20,000,000
D1	report on best maintenance practices in minimills	80 %	\$3,000	\$30,000,000
D2	Contracting of regional NDT companies	70 %	\$5,000	\$20,000,000
D3	Report on best safety practices in minimills	80 %	\$5,000	--

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D4	Most effective training programs	80 %	\$10,000	--
D5	SMA-DOE Steel Fellowship Program	100 %	\$50,000	\$1,000,000
D6	Regional carriers to minimize transportation costs	70 %	\$3,000	\$20,000,000

EXHIBIT 3

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EXHIBIT NOT SUSCEPTIBLE TO REDACTION

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EXHIBIT 4

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EXHIBIT 5

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